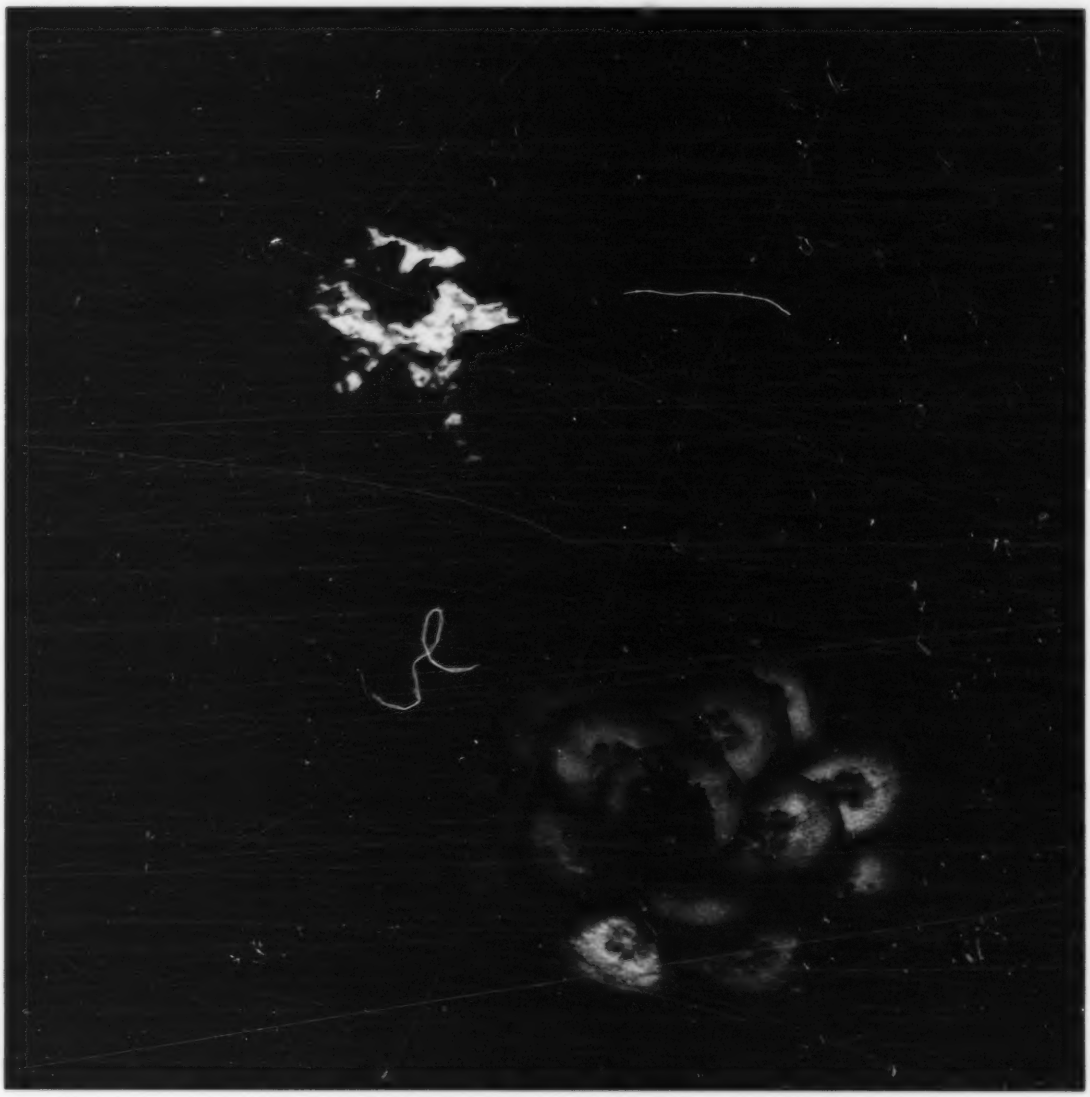
Economics Information

REPT NO: 88-05

ISSN: 0708-482X

Ontario

GREENHOUSE VEGETABLE PRODUCTION IN ESSEX COUNTY: PRODUCTION COSTS AND PRACTICES, 1986 AND 1987



ECONOMICS AND POLICY
COORDINATION BRANCH

ONTARIO MINISTRY OF AGRICULTURE AND FOOD
LEGISLATIVE BUILDINGS, TORONTO, ONTARIO, M7A 1B6

The Ministry of Agriculture and Food assumes no responsibility as a result of the reader relying or acting upon the information contained herein. Any use or misuse of the information is the sole responsibility of the reader.

photo credit:
Ontario Greenhouse Vegetable Producers' Marketing Board

90-04704/

ECONOMICS INFORMATION
REPORT NO. 88-05

GREENHOUSE VEGETABLE PRODUCTION IN ESSEX COUNTY: PRODUCTION COSTS AND PRACTICES, 1986 AND 1987

by

G.A. Fisher

Economics and Policy Coordination Branch
Ontario Ministry of Agriculture and Food
Legislative Building, Queen's Park
Toronto, Ontario
M7A 1B6

July, 1988

ISBN: 0-7729-4370-2

TABLE OF CONTENTS

	Page
Introduction	1
The Greenhouse Vegetable Industry in Ontario	1
Organization of the Study	2
Methods Used in Calculating Costs	3
Cash and Non-Cash Costs	5
Summary of Costs and Returns	5
Greenhouse Vegetable Production Practices in Essex County	9
Growing and Harvesting Periods	9
Labour Use and Distribution	9
Updating Greenhouse Vegetable Production Costs from 1986-1987, Essex County	12

LIST OF TABLES

Table

1	Greenhouse Vegetable Production Area by District, Ontario, Spring, 1988	2
2	Some Characteristics of Greenhouse Vegetable Production, Essex County, 1986	6
3	Greenhouse Grown Seedless Cucumbers and Tomatoes, Costs and Returns per Acre and per Square Foot, Essex County, 1986	7
4	Greenhouse Grown Seedless Cucumbers and Tomatoes, Cost and Returns per Unit of Production, Essex County, 1986	8
5	Production Practices - Growing and Harvesting Days, Greenhouse Tomatoes, Essex County, 1986	10
6	Production Practices - Growing and Harvesting Days, Greenhouse Seedless Cucumbers, Essex County, 1986	11
7	Source of Labour for Greenhouse Vegetable Production, Essex County, 1986	11
8	Production Practices - Labour Use and Distribution by Month, Greenhouse Tomatoes and Seedless Cucumbers, Essex County, 1986	12
9	Updated Greenhouse Tomato Production Costs, Essex County, 1986 and 1987	14
10	Updated Greenhouse Seedless Cucumber Production Costs, Essex County, 1987	15
11	Greenhouse Vegetable Costs and Returns in Essex County, 1965-1966, 1973, and 1986	16

INTRODUCTION

The production of greenhouse vegetable tomatoes and seedless cucumbers under glass and plastic is an important enterprise to the southern part of Essex county. The combined value of tomatoes and cucumbers in 1986 amounted to $33.5 million and rose to $35.7 million in 1987. This industry in turn pays out many millions of dollars to procure inputs of production to agricultural businesses, and to hire labour within the local area.

Growing vegetables under glass or plastic greenhouses is an intensive form of agriculture requiring large inputs of labour and materials. Initial capital requirements are high and often deter entrance or expansion in the industry.

Successful production of greenhouse vegetables varies between years and between operations. Of the many factors that influence success, yields and prices are major items in determining profit or loss. In recent years, greenhouse vegetable producers have been faced with rising costs at a time when competition from imported tomatoes grown either in outside fields or in areas where labour and heat sources are relatively cheap.

The Greenhouse Vegetable Industry in Ontario

Although greenhouse vegetables, tomatoes and cucumbers are grown in all areas of Ontario, the major producing areas are located in the southern part of Essex county, along the north shore of Lake Erie, the Bradford Marsh, and Niagara-Hamilton region. Greenhouse vegetable producers in Ontario grow under the Ontario Greenhouse Vegetable Producers' Marketing Board. This board establishes prices of greenhouse grown tomatoes and cucumbers after consultation with packer-shippers and wholesalers who collectively review current market conditions. The board appoints agents for the sale of greenhouse tomatoes and seedless cucumbers.

The board sponsors information meetings for greenhouse grower members and promotes the consumption of seedless cucumbers and pink and red greenhouse tomatoes.

The board's main office is located in Leamington, Ontario, while a sub-office is located in the Ontario Food Terminal buildings in Toronto.

The board has divided the greenhouse vegetable producing areas of Ontario into four districts as outlined in the footnote to Table 1. Essex county is located in District 1 and with the exception of a few small producers in Kent and Lambton counties, all the greenhouse vegetable production for this district is located in Essex county.

According to the latest survey[1], 74 percent of the greenhouse vegetable production area in Ontario is located in Essex county. This represents 147 growers which is 54 percent of all the greenhouse vegetable growers who are registered with the board (Table 1).

In addition to tomatoes and cucumbers, growers are also producing lettuce, peppers and certain specialty vegetables under glass and plastic in Ontario.

Over the years, the Economics and Policy Coordination Branch, Ontario Ministry of Agriculture and Food has conducted several surveys on greenhouse vegetables.

The first study entitled "Greenhouse Vegetable Production in Essex County, Production Costs, Returns and Management

---

1 ***Greenhouse Vegetable Statistics - 1987, Production, Areas, Yields and Returns for Ontario***, by G.A. Fisher.

Practices, 1965 and 1966" by G.A. Fisher and Paul Hedlin. The following study was conducted to cover the major greenhouse production areas in Ontario.

"Greenhouse Vegetable Production in Ontario, Production Costs and Returns to Risk and Management - 1973" by G.A. Fisher. This report studied costs from the three main vegetable producing areas of Ontario, Essex, Niagara and Bradford.

Realizing the importance of the greenhouse vegetable industry to the area as well as the changes that have occurred, the Ontario Greenhouse Vegetable Producers' Marketing Board requested that an updated study be carried out in the Essex county area for 1986. This report provides the results of that study as well as the updated cash costs of greenhouse tomatoes and cucumbers for 1987.

Organization of the Study

In order to be able to study separately the costs and practices involved in the production of either greenhouse grown tomatoes and cucumbers, a confidential list of only those growers who produced either one of these crops was provided by the office of the Ontario Greenhouse Growers' Marketing Board. In addition, the survey excluded growers with under 22,000 square feet of production.

Table 1:--Greenhouse Vegetable Production Area by District, Ontario, Spring 1988

District*	No. of Growers	Greenhouse Area			
		Glass	Plastic	Total	Grower
		- square feet -			
1	147	7,115,605	4,080,700	11,196,305	76,165
2	35	613,760	256,700	870,460	24,870
3	69	1,028,200	917,885	1,946,085	28,204
4	19	586,960	482,200	1,065,160	56,061
Total	270	9,308,765	5,737,485	15,078,010	55,844

* Production districts as defined by the Ontario Greenhouse Vegetable Producers' Marketing Board for growers who indicated to the Board survey that they would be producing greenhouse-grown tomatoes and/or cucumbers during the spring of 1988 are as follows:

District 1 - Essex Kent, and Lambton counties.
District 2 - Brant, Elgin, Middlesex, Oxford counties and the Norfolk part of the regional municipality of Norfolk-Haldimand.
District 3 - Regional municipalities of Niagara, Hamilton-Wentworth, and the Haldimand part of the regional municipality of Norfolk-Haldimand.
District 4 - Regional municipalities of Halton, Peel, York and Durham, and the counties of Simcoe and Wellington.

Cooperating growers from the prepared lists were selected on their willingness to provide information on their greenhouse vegetable crops. Through the use of accounting production, marketing and other records, information was tabulated for each cooperating grower. All information collected from each grower was treated in a confidential manner and only averages for all growers were published. A preliminary report was prepared and circulated to cooperating growers, and was presented at several grower information meetings.

Although one call was made on each cooperating grower, some return calls were made when there were problems in record interpretation. It is recognized that some inadequacies can occur when a complete year's operation for such a complex and intensive industry is tabulated in one call. The information in this report applies to the cooperating growers only and should not be interpreted as representative of all greenhouse vegetable operations in the Essex county area.

Mrs. Dale Jarrell very capably carried out the field survey portion of this study in the summer of 1987.

Methods Used in Calculating Costs

Labour Hours, Costs and Benefits

Hired labour costs were entered at the amounts actually paid. Labour benefits including Workers' Compensation, Canada Pension, Unemployment Insurance, housing, transportation and other minor benefits.

The hours spent by the operator, spouse, and family in greenhouse production were estimated. For this study, the operator's labour was valued at $6.75 per hour and adult family labour was valued at a rate equal to that paid to hired help. When children helped in the greenhouse, their wage allowances were scaled down in relation to their capabilities.

Production Supplies

All costs were included for the purchase of seed, plants, fertilizer, sprays, dusts, soils, peat pots, and any other supplies used. Were possible all production supplies used to produce outside crops were deleted.

Heating Fuel

The cost of all fuel used to heat the greenhouse was recorded as given.

Utility Costs

Utility costs cover electricity, telephone, and water, where applicable. In most cases, the cost apportioned to the operator's house was not included in the utility costs.

Truck and Automobile Costs

All growers used some type of truck for hauling greenhouse produce to the shipper. Costs include gas, oil, repairs, license and insurance. Automobile expenses include only the farm share. Only a portion of the car's investment and operating costs were included.

Interest Charges on Operating Capital and Bank Charges

Where possible, only the interest paid on short-term operating loans and bank service charges was included. Because an interest rate is allowed on investment in land, buildings, and machinery, the interest paid on mortgages and other capital expenditures was not collected.

Maintenance Costs for Buildings and Machines

Maintenance costs include plastic replacement and repairs to greenhouses, boilers, heating equipment, tractors, and all

other machinery used. The amount of machinery maintenance costs applicable to any outside crops was deducted.

Other Costs

Other costs recorded were accounting, legal fees, office supplies, rentals and insurances carried on greenhouse structures, equipment and for liability protection.

Land Value and Taxes

The amount of land allowed for each greenhouse vegetable operation on the study was equal to twice the size of the reported greenhouse area. Land in this study was valued at $3,000 per acre, regardless of the location.

The interest rate used on land for 1986 was the real interest rate. The "real interest rate" is defined as the current lending rate of interest adjusted for inflation. This rate in 1986 amounted to 6.6 percent. To reflect the Ontario Farm Tax Reduction Program, one-half of the reported real estate taxes were used.

Interest on Investment and Depreciation

These two items cause the most controversy in calculating the financial position of a farming enterprise. In any study of production costs and management, an attempt must be made to assess the grower's position on a comparable basis with the average of all other growers on the study.

For this study, each cooperating grower was asked to give the present value for all greenhouses, buildings, and equipment used in his greenhouse vegetable operations. For those growers who were not able or were unsure of these present values, replacement costs less accumulated depreciation to allow for the years of use were used to determine the present values for glass and plastic houses, boiler rooms, and other buildings.

The owners' or operators' homes were not included in the total investments for each operation in the study.

Depreciation was taken at 2 percent for glass houses, and 5 percent for plastic houses. Depreciation on steel and concrete boiler rooms was taken at 2 percent and wooden buildings at 5 percent.

Interest on building present value investment was taken at 6.6 percent, which was also used in calculating interest on land investment.

From the tractor, truck and greenhouse equipment present values; depreciation for tractors, trucks and the business share of the automobile was taken at 15 percent; depreciation for all other greenhouse equipment was taken at 10 percent. The business share of the automobile was valued at a maximum of $3,000 per grower unless a smaller or no value for car use was given.

Interest on the investment in machinery was calculated on the assumption that equity was 100 percent. The interest rate used was calculated at 6.1 percent, which was the average interest rate paid by chartered banks on savings accounts for 1986.

Marketing Charges

The marketing charges which include all charges as regulated by the Greenhouse Growers' Marketing Board for Leamington based shippers. These include a 6 percent sales commission, packing and container costs, board fees, advertising, research and feature deductions.

Yields and Gross Returns

All growers reported total yields of either greenhouse tomatoes or seedless cucumbers that were marketed in the period January 1, 1986 to December 31, 1986. If they were unsure of the exact yield, permission was granted and their yields were checked at the appropriate shipper. Growers also indicated the number of plants used as well as planting and harvesting dates.

All greenhouse growers in the Leamington area receive net returns which are gross returns less marketing charges as outlined earlier. To obtain the actual gross returns, the marketing charges were calculated for each cooperating grower and added to the net returns. These are the net returns as reported by each grower from the sale of tomatoes or seedless cucumbers. If reported, the gross returns also included any rebates received from shippers.

Cash and Non-Cash Costs

In this study cash costs included payment for all those goods and services required to produce the greenhouse vegetable crops. These costs include the marketing charges, and the costs for all the inputs of production as outlined in this report.

Non-cash costs include those inputs where a calculated cost was made. These inputs are interest on investment, depreciation and a wage allowance for the owner and/or operator, the spouse and family members who do not regularly draw a fixed labour rate.

Many greenhouse operations owe their present existence to many long hours put in by the operator, spouse, and family members, the use of the depreciation allowance, and to a major portion of their greenhouses that were built in less costly times.

Summary of Costs and Returns

After accounting for all marketing charges and cash costs of production, the amount that the greenhouse vegetable crop contributes to the operator and to the family for wages and management and the costs of owning machinery, buildings and land is called the GROSS MARGIN. For those Essex county growers on the study in 1986, the gross margin for tomatoes was $23,548 per acre or $0.11 per pound and for seedless cucumbers was $23,461 per acre or $1.01 per dozen (Tables 3 & 4).

When all costs were considered, including the non-cash costs, the resulting net returns showed a loss for both tomatoes and seedless cucumbers (Table 4).

Total production costs as calculated from the study for tomatoes were $173,510 per acre, $3.98 per square foot; and $0.88 per pound. Total production costs for seedless cucumbers were $187,936 per acre, $4.31 per square foot; and $7.99 per dozen (Tables 3 & 4).

These average production costs and practices as obtained from the 1986 study in Essex county provide an opportunity for growers to make comparisons with their own greenhouse vegetable crops. By comparing their production costs with these averages, greenhouse vegetable producers can identify areas where changes in production and/or management practices can help to improve or maintain their financial standing.

Table 2:--Some Characteristics of Greenhouse Vegetable Production, Essex County, 1986

	Seedless Cucumbers	Tomatoes
Number of Growers	13	14
Average per Grower	- square feet -	
Glass Greenhouse	51,346	45,957
Plastic Greenhouse	14,231	36,768
Total Area	65,577	82,725
Marketed production	35,362 doz.	73,372 lbs.
Number of plants	10,243	19,297
Marketed per plant	41.4 cukes	19.3 lbs.
Number of harvest days	214	146
Labour Use per Greenhouse Acre	- hours -	
Owner	2,314	1,784
Spouse	800	1,109
Family	747	1,717
Hired	2,651	2,485
Total Labour	6,512	7,095
Investment (Present Value)[a]	- dollars -	
Per Greenhouse Acre	278,590	267,828
Production Factors		
Number of plants per acre	6,829	10,156
Gross dollars received per plant	23.47	14.01
Gross dollars received per square foot	3.67	3.27

[a] Does not include a value for the owner's home.

Table 3:--Greenhouse Grown Seedless Cucumbers and Tomatoes, Costs and Returns per Acre and per Square Foot, Essex County, 1986

	Seedless Cucumbers		Tomatoes	
	Per Acre	Per Sq. Ft.	Per Acre	Per Sq. Ft.
	- dozen -		- pounds -	
Yield	23,490	.5	196,585	4.5
	- dollars -			
Gross Sales	159,667	3.67	142,318	3.27
Marketing Charges				
Packing (cartons, fees, etc.)	28,233	.65	23,486	.54
Commission Sales	9,489	.22	8,535	.20
Total Marketing	37,722	.87	32,021	.74
Net Sales (after marketing)	121,945	2.80	110,297	2.53
Cash Costs				
Hired Labour (plus benefits)	15,748	.36	14,736	.34
Growing Supplies	12,668	.29	10,138	.23
Fuel - Greenhouse Heat	47,144	1.08	36,669	.84
Utilities	2,703	.06	3,440	.08
Insurance	3,938	.09	5,584	.13
Taxes - Real Estate	1,701	.04	1,482	.03
Repairs & Maintenance (bldg. & machines)	8,725	.20	7,521	.17
Truck & Auto	1,649	.04	1,498	.03
Interest (short-term)	2,368	.05	3,455	.08
Other (office, accounting)	1,840	.04	2,226	.05
Total Cash Costs	98,484	2.25	86,749	1.98
Gross Margin	23,461	.55	23,548	.55
Non-Cash Costs				
Interest on Investment	18,151	.42	18,833	.43
Depreciation	10,719	.25	12,805	.30
Wage Allowance - Operator & Spouse	19,515	.45	16,486	.38
Wage Allowance - Family	3,345	.07	6,616	.15
Total Non-Cash Costs	51,730	1.19	54,740	1.26
Total All Costs	187,936	4.31	173,510	3.98
NET after All Costs	(28,269)	(.64)	(31,192)	(.71)

Table 4:--Greenhouse Grown Seedless Cucumbers and Tomatoes, Costs and Returns per unit of Production, Essex County, 1986

	Cucumbers		Tomatoes	
	Value	% of Total Costs	Value	% of Total Costs
	- $/dozen -		- $/pound -	
Gross Sales	6.80		.72	
Marketing Charges				
Packing (cartons, fees, etc.)	1.20	15.0	.12	13.6
Commission Sales	.40	5.0	.04	4.6
Total Marketing	1.60	20.0	.16	18.2
Net Sales after Marketing	5.20		.56	
Cash Costs				
Hired Labour & Benefits	.67	8.4	.07	7.9
Growing Supplies	.54	6.7	.05	5.7
Fuel - Greenhouse Heat	2.01	25.2	.19	21.6
Utilities	.12	1.5	.02	2.3
Insurance	.17	2.1	.03	3.4
Taxes - Real Estate	.07	.9	.01	1.1
Repairs & Maintenance (building & machines)	.37	4.6	.04	4.6
Truck & Auto	.07	.9	.01	1.1
Interest (short-term)	.10	1.2	.02	2.3
Other (accounting, office, etc.)	.07	.9	.01	1.1
Total Cash Costs	4.19	52.4	.45	51.1
Gross Margin	1.01		.11	
Non-Cash Costs*				
Interest Investment	.77	9.6	.10	11.4
Depreciation	.46	5.8	.06	6.8
Wage Allowance - Operator & Spouse	.83	10.4	.08	9.1
Wage Allowance - Family	.14	1.8	.03	3.4
Total Non-Cash Costs	2.20	27.6	.27	30.7
Total All Costs	7.99	100.0	.88	100.0
NET after All Costs	(1.19)		(.16)	

* These are calculated figures.

GREENHOUSE VEGETABLE PRODUCTION PRACTICES IN ESSEX COUNTY

Greenhouse vegetable producers in the Essex county area in recent years have turned to the growing of an extended one cropping system for tomatoes and seedless cucumbers. A small amount of lettuce, peppers and specialty vegetable crops are also being grown on a limited scale.

Growing and Harvesting Periods

Greenhouse tomato growers in the Essex area have now almost completely switched to one crop per year. Under this production system, seeding is done in early December, with transplanting into glass houses occurring in early to mid-January. Among study growers using glass, the first tomato harvest commenced in mid-March, with the average grower starting around the first of April. For glass house growers the days of harvest averaged 143 and finished in a period from early August to mid-September (Table 5).

Growers using plastic houses to grow tomatoes spread their transplanting over a wider period from mid-January to the end of February. For these growers, the length of harvest was shorter, averaging 118 days, finishing around the end of August (Table 5).

Greenhouse cucumber growers using glass houses, showed a wider range in transplanting which ranged from mid-December to the end of January. The average cucumber grower carried out transplanting in early January. The first cucumber harvest occurred on January 20, with most growers commencing harvest in early February. For glass house cucumber growers the days of harvest averaged 231 days and finished over a wide interval ranging from August 16 to November 16. This extended harvest period may have occurred due to the fact that several growers were attempting to produce a fall crop of seedless cucumbers. To date the production of fall seedless cucumbers in the Essex area has not proven successful. No doubt improved varieties and cultural practices will in the future allow this practice to take place (Table 6).

Those growers who produced seedless cucumbers in plastic houses spread the transplanting over a period ranging from January 20 to March 15, with most occurring in mid-February. Again the last harvest date extended over a wide period from August 24 to November 16. As for tomatoes, the length of harvest for cucumbers grown in plastic houses averaged 193 days (Table 6).

Labour Use and Distribution

The requirement for labour in the production of either greenhouse tomatoes or cucumbers is considerable,and amount to 6,512 hours per greenhouse acre for cucumbers and 7,095 hours for tomatoes.

Growers on the study in 1986, obtained for tomato production 35 percent of their labour from off-farm hired help and for seedless cucumbers 41 percent. The owner or operator's spouse and family play an important role in providing labour for production. The owner and spouse in most cases, unless a limited company has been formed, do not draw a regular wage. The family members are paid a wage, which is usually comparable to the wage rate paid to comparable hired help. Family members, including spouse, play an important role in the success of the greenhouse operation and supplied for tomatoes 40 percent of the labour needs. In comparison, they supplied only 23 percent of the total labour required to operate an acre of greenhouse grown seedless cucumbers (Table 7).

In Table 8, a distribution of total labour use by month for the production of one acre of tomatoes and seedless cucumbers is shown. These hours are only for the operations of production, harvesting and hauling to the packer. Hours involved in grading and packing are done by a central packer and are shown only in the costs under marketing charges. The peak demand for labour occurs during the period of harvest. For tomatoes this occurs from April through August, with peak demands occurring in May, June and July. For cucumbers, harvest ranges from April through to October, with peak demands in April, May, June and July.

While maintenance, repairs and general clean-ups occur the year round, the months of September, October and early November are usually reserved for these operations. In November and December, growers are preparing the seedbed and seeding for the start of their crops. The months of January and February, while being the coldest months, are the months when most growers are transplanting into their glass houses and preparing seedbeds in their plastic houses (Table 8).

Table 5:--Production Practices - Growing and Harvesting Days, Greenhouse Tomatoes, Essex County, 1986

	Earliest Date	Latest Date	Average Date
Glass Greenhouse			
Transplanting[a]	Jan 2	Jan 15	Jan 8
First Harvest	Mar 17	Apr 21	Apr 3
Days Transplant to First Harvest	74	96	85
Last Harvest	Aug 3	Sept 14	Aug 24
Days of Harvesting	139	146	143
Plastic Greenhouse			
Transplanting[a]	Jan 15	Feb 28	Feb 6
First Harvest	Mar 30	May 26	Apr 28
Days Transplant to First Harvest	74	87	81
Last Harvest	Aug 10	Sept 7	Aug 24
Days of Harvesting	133	104	118

[a] Transplant date that plants were set out into the greenhouse.

Table 6:--Production Practices - Growing and Harvesting Days, Greenhouse Seedless Cucumbers, Essex County, 1986

	Earliest Date	Latest Date	Average Date
Glass Greenhouse			
Transplanting[a]	Dec 13	Jan 30	Jan 6
First Harvest	Jan 20	Mar 3	Feb 10
Days Transplant to First Harvest	38	32	35
Last Harvest	Aug 16	Nov 16	Oct 1
Days of Harvesting	208	242	231
Plastic Greenhouse			
Transplanting[a]	Jan 20	Mar 15	Feb 16
First Harvest	Feb 28	Apr 20	Mar 26
Days Transplant to First Harvest	39	36	38
Last Harvest	Aug 24	Nov 16	Oct 5
Days of Harvesting	177	210	193

Table 7:--Source of Labour for Greenhouse Vegetable Production, Essex County, 1986

	Tomatoes		Seedless Cucumbers	
	Hours	% of Total	Hours	% of Total
	- hours per greenhouse acre -			
Owner or operator	1,784	25	2,314	36
Spouse	1,109	16	800	12
Family	1,717	24	747	11
Hired	2,485	35	2,651	41
Total	7,095	100	6,512	100

[a] Transplant date that plants were set out into the greenhouse.

Table 8:--Production Practice - Labour Use and Distribution by Month, Greenhouse Tomatoes and Seedless Cucumbers, Essex County, 1986

Month	Tomatoes	Seedless Cucumbers
	- labour hours/greenhouse acre-	
January	350	300
February	200	350
March	350	400
April	800	700
May	1,250	1,000
June	1,250	1,000
July	900	900
August	900	700
September	300	400
October	250	200
November	200	200
December	250	350
Total	7,000	6,500

UPDATING GREENHOUSE VEGETABLE PRODUCTION COSTS FROM 1986-1987, ESSEX COUNTY

Updating procedures were used to estimate the overall change in the cash cost position of the Essex area's greenhouse tomato and seedless cucumber crops from 1986 to 1987. In updating any crop production costs, it is always difficult to obtain exact percentages for the change in each cost input. The amounts of each input used can vary from year to year depending on requirements, recommendations, or technological changes. Therefore, updating procedures at best can be based only on general trends of change.

Price indexes of farm inputs for Eastern Canada were used to update the cost of producing crops of greenhouse tomatoes and cucumbers from 1986 to 1987. Marketing charges were assumed to be the same as those charged in 1986 for a yield of 196,585 pounds of tomatoes and 23,490 dozen of seedless cucumbers per greenhouse acre (Table 3).

The price index numbers of farm inputs were obtained from Statistics Canada Catalogue 62-004, fourth quarter 1987. The inputs of greenhouse vegetable production were updated as follows:

- **Hired Labour** including benefits, were updated using the hourly rated index (128.8 to 135.4).

- **Growing Supplies** used the index for crop production (104.3 to 108.1).

- **Fuel-heating greenhouse** costs depend on changes in price of the fuel used. In Essex county over 80 percent of the greenhouse vegetable operations use natural gas for heating. Industry sources report that a 3 percent decline occurred in the price of natural gas for the calendar year 1987 over 1986. This decline does not take into consideration any possible changes in weather conditions over the two years.

- The remainder of the greenhouse vegetable operations in Essex county use either heavy or light oil as a heat source. Heating costs for both greenhouse tomatoes and cucumbers were decreased by three percent in 1987 over 1986 for this update.

- **Utilities** used the index for supplies and services (126.6 to 131.7).

- **Insurance** used the index for motor vehicle insurance (162.0 to 171.2).

- **Repairs and maintenance for buildings** used building repair index (132.1 to 138.7); machines used the machine maintenance index (121.0 to 124.7).

- **Truck and auto** used the machinery and motor vehicle operation index (119.7 to 116.8).

- **Taxes - real estate** used the property taxes index (128.3 to 135.2).

- **Interest (short-term)** used the non-mortgage interest index (67.2 to 62.0).

- **Other inputs** used the supplies and services index (126.6 to 131.7).

In this update, only the cash costs of production were updated. Marketing charges and yields remained the same in 1987 as in the 1986 study. The non-cash costs such as interest on investment, depreciation and an allowance for family wages were not updated.

Using this method of updating greenhouse vegetable production costs, the Essex area's cash costs plus marketing charges for tomatoes were $119,403 per greenhouse acre; $2.74 per square foot and $0.61 per pound (Table 9).

For seedling cucumber production updated cash costs are $136,694 per greenhouse acre; $3.14 per square foot and $5.82 per dozen (Table 10).

Table 9:--Updated Greenhouse Tomato Production Costs, Essex County, 1986 and 1987

	1986	Update Change	1987
	pounds		pounds
Yield (per greenhouse acre)	196,585		196,585
	dollars	%	dollars
Marketing Charges[a]	32,021	-	32,021
Cash Costs[b]			
Labour, hired	14,736	+5.1	15,488
Growing supplies	10,138	+3.6	10,503
Fuel - Heat	36,669	-3.0	35,569
Utilities	3,440	+4.0	3,578
Insurance	5,584	+5.7	5,902
Taxes - Real Estate	1,482	+5.4	1,562
Repairs & Maintenance, Building	4,434	+5.0	4,656
Repairs & Maintenance, Machines	3,087	+3.1	3,183
Truck & Auto	1,498	-2.5	1,461
Interest (short-term)	3,455	-8.4	3,165
Other	2,226	+4.0	2,315
Total Cash Costs	86,749	+.7	87,382
Total Cash Costs plus Marketing Costs			
Per greenhouse acre	118,770		119,403
Per pound	.60		.61

[a] From 1986 study.

[b] Updated from 1986 to 1987 using price index numbers to show changes.

Table 10:--Updated Greenhouse Seedless Cucumber Production Costs, Essex County, 1986 and 1987

	1986	Update Change	1987
	dozen		dozen
Yield per Greenhouse Acre	23,490		23,490
	dollars	%	dollars
Marketing Charges[a]	37,722	-	37,722
Cash Costs[b]			
Labour, Hired	15,748	+5.1	16,551
Growing Supplies	12,668	+3.6	13,124
Fuel - Heat	47,144	-3.0	45,730
Utilities	2,703	+4.0	2,811
Insurance	3,938	+5.7	4,162
Taxes, Real Estate	1,701	+5.4	1,793
Repairs & Maintenance, Building	6,041	+5.0	6,343
Repairs & Maintenance, Machines	2,684	+3.1	2,767
Truck & Auto	1,649	-2.5	1,608
Interest (short-term)	2,368	-8.4	2,169
Other	1,840	+4.0	1,914
Total Cash Costs	98,484	+.5	98,972
Total Cash Costs plus Marketing Costs			
Per Greenhouse Acre	136,206		136,694
Per Dozen	5.80		5.82

[a] From 1986 study.

[b] Updated from 1986 to 1987 using price index numbers to show changes.

Table 11:--Greenhouse Vegetable Costs and Returns, Essex County, 1965-1966, 1973, and 1986[a]

	1965-1966		1973		1986[b]	
	Dollars Weighted per Acre	% of Total	Dollars Weighted per Acre	% of Total	Dollars Weighted per Acre	% of Total
Gross Returns	38,298	-	47,706	-	149,673	-
Cash Costs						
Marketing Charges	7,660	18.2	7,445	13.7	34,439	19.2
Hired Labour & Benefits	4,544	10.8	3,320	6.1	15,165	8.4
Growing Supplies	1,769	4.3	2,651	4.9	11,210	6.2
Fuel - Greenhouse Heat	6,740	16.0	9,080	16.7	41,110	22.9
Utilities	896	2.1	930	1.7	3,128	1.7
Insurance	770	1.8	908	1.7	4,886	2.7
Taxes - Real Estate	954	2.3	1,070	2.0	1,575	.9
Repair & Maintenance (building & machines)	1,478	3.5	2,275	4.2	8,031	4.5
Truck & Auto	504	1.2	619	1.1	1,562	.9
Interest (short-term)	498	1.2	684	1.3	2,994	1.7
Other	942	2.2	452	.9	2,063	1.1
Total Cash Costs	26,755	63.6	29,434	54.3	126,163	70.2
Non-Cash Costs						
Interest on Investment	5,377	12.8	8,163	15.1	18,547	10.3
Depreciation	4,425	10.5	5,265	9.7	11,921	6.7
Wage Allowance - Operator & Family	5,533	13.1	11,351	20.9	17,770	9.9
Total Non-Cash Costs	15,335	36.4	24,779	45.7	53,467	29.8
Total Costs	42,090	100.0	54,213	100.0	179,630	100.0
NET after All Costs	(3,792)	-	(6,507)	-	(29,957)	-
Sample Characteristics						
Number of Growers	23		12		27	
Labour Hours per Acre	6,756		6,038		6,847	
Average Area, sq. ft.	68,040		50,162		74,468	

[a] A different sample of growers was selected in each study period.

[b] Weighted averages of totals from tomato and seedless cucumber crops on study.

RECENT PUBLICATIONS FROM THE ECONOMICS AND POLICY COORDINATION BRANCH OF THE ONTARIO MINISTRY OF AGRICULTURE AND FOOD

Processing Tomato Statistics, Production Areas, Yields and Returns for Ontario and United States, by G.A. Fisher, March 1987.

Strawberry Production Costs in Ontario, by Dirk Buth and Errol McKibbon. Economics Information, Rept. No. 84-03, March 1984.

Survey of Pesticide Use in Ontario, 1983, by Bill McGee. Economics Information, Rept. No. 84-05, January 1985.

Raspberry Production Costs in Ontario, 1984, by Errol McKibbon and Dirk Buth. Economics Information, Rept. No. 85-06, September 1985.

Agricultural Statistics for Ontario, 1987, by Statistical Services Unit.

Applied Risk Analysis at the Farm Level, by Gervan Fearon. Economics Research, October 1986.

Grain and Forage Crops: Estimated Production Costs, Ontario, 1988, by Blair Campbell and G.A. Fisher. Economics Information, Rept. No. 88-06, July 1988.

Apple, Peach and Grape: Estimated Establishment Costs, Ontario, 1988, by E.D. McKibbon. Economics Information, Rept. No. 88-09, August 1988.

Fruit Crops: Estimated Production Costs, Ontario, 1988, by E.D. McKibbon. Economics Information, Rept. No. 88-07, August 1988.

Vegetable Crops: Estimated Production Costs, Ontario, 1988, by G.A. Fisher, Blair Campbell and E.D. McKibbon. Economics Information, Rept. No. 88-08, August 1988.

Cash Rental Rates in Ontario, 1987, by G.A. Fisher. Economics Information, Rept. No. 88-01, January 1988.

Greenhouse Vegetable Statistics, Production, Areas, Yields and Returns for Ontario, 1987, by G.A. Fisher. Economics Information, Rept. No. 88-04, May 1988.

Survey of Custom Farmwork Rates Charged in Ontario, 1987, by G.A. Fisher. Economics Information, Rept. No. 88-03, January 1988.

Maple Syrup Production Costs in Ontario, by Dirk Buth. Economics Information, Rept. No. 88-02, February 1988.

Single copies of the above publications are available on request from the Consumer Information Centre, Ontario Ministry of Agriculture and Food, Ground Floor, 801 Bay Street, Toronto, Ontario, M7A 1B6. (416) 965-1421.

ISBN-0-7729-4370-2